

App. No. 10/712,367
Response filed with RCE

REMARKS/ARGUMENTS

This is a Response filed with a Request for Continued Examination. The amendment and remarks are fully response to the final Office Action mailed on June 14, 2005 and to the Advisory Action mailed on August 17, 2005. Reexamination and reconsideration are courteously requested. Upon entry of the present amendment, claims 30, 35, 37 to 43, 48, and 50 to 53 are pending for the Examiner's consideration, with claims 30 and 43 being independent claims.

The specification is also amended at paragraph [0001] to add the filing date of the parent U.S. application to which priority is claimed.

A. Rejections Under 35 U.S.C. § 103(a)

Claims 30, 34 to 35, 38 to 43, 47 to 48, and 51 to 53 are rejected as being unpatentable over U.S. Patent No. 6,099,394 ("James") in view of U.S. Patent No. 5,584,146 ("Shamouillan") and/or U.S. Patent No. 6,537,134 ("Newell"). Claims 36 to 37, and 49 to 50 are rejected as being unpatentable over James in view of U.S. Patent No. 5,958,794 ("Bruxvoort"). Claims 30, 34 to 43, and 47 to 53 are rejected as being unpatentable over 1) U.S. Patent No. 3,850,589 ("Charvat 589") in view of James and/or Bruxvoort or Shamouillan or Newell; 2) U.S. Patent No. 4,588,420 ("Carvat 420") in view of James and/or Bruxvoort or Shamouillan or Newell; 3) Bruxvoort in view of James or Shamouillan or Newell; and 4) U.S. Patent No. 5,110,322 ("Narayanan") in view of James and/or Bruxvoort or Shamouillan or Newell. These rejections are respectfully traversed.

Each of the cited prior art references fails to teach or suggest a unique set of features included in the independent claims. Pending independent claim 30, directed to a polishing article for chemical-mechanical polishing a workpiece, recites a substantially uniform mixture that includes, among other things, a low weight:weight ratio between a binder resin and a friable filler material having a hardness less than 3 on the Mohs scale. More particularly, the polishing article is constructed with the resin included at a concentration that is between about 5% and

App. No. 10/712,367
Response filed with RCE

about 15% by weight of the filler material. Having the friable filler material at a high concentration with respect to the binder resin causes the polishing surface to continually wear during polishing, and thereby facilitates continuous exposure of the abrasive. Likewise, independent claim 43, directed to a method for chemical mechanical planarization of a workpiece surface, recites a polishing step using a polishing article that includes the binder resin and the friable filler material having a hardness less than 3 on the Mohs scale at the low weight:weight ratio. The references cited in the final Office Action fail to teach that in a polishing pad, a heat-curable resin having an epoxy group is included at between about 5% and about 15% by weight of the friable filler.

Each reference, and the features disclosed by each, has been discussed in the prior response, and the arguments made therein are incorporated herein in order to be fully responsive to the final Office Action. The following discussion is respectfully presented in order to satisfy a request by the Examiner for a more detailed explanation that the ratio claimed in the independent claims is not disclosed by James.

In the final Office Action, and in the subsequently entered Advisory Action, the Examiner relies on James for allegedly disclosing a binder that includes heat curable resin having an epoxy group, the resin being included at between about 5% and about 15% of the filler material. The Examiner asserts, "[James] teaches amounts for the filler and binder and when these amounts are calculated in terms of a ratio, said ratio will encompass the claimed ranges." The Examiner acknowledges that none of the other cited prior art references teach this feature, but repeatedly asserts, "the examiner acknowledges [the deficiency regarding the claimed ratio in the other prior art references] but has made an obviousness determination based on a combination of references and applicant has not clearly and persuasively argued this rejection (reference combined with James et al.)."

James discloses a polishing pad that includes a matrix material having clusters of hard "high modulus" abrasives dispersed throughout the matrix, the clusters of abrasive being bound by a "low modulus" material. The matrix, and/or the low modulus material that binds the clusters, may be resins that include an epoxy group (col. 6, line 39; col. 6, lines 29 to 34). When defining the matrix, James teaches that various additives can be included, one such

App. No. 10/712,367
Response filed with RCE

additive including fillers. James teaches that if fillers are added, the total matrix weight can be up to 80% filler (col. 7, lines 4 to 8). From this teaching, a simple calculation can be used to determine that if the matrix is chosen to be a resin having an epoxy group, the resin can not possibly be present at between about 5% and about 15% by weight of the filler material. Supposing that 100 g of matrix is included in the James polishing pad, then the filler material can be no more than 80 g of the matrix, and the resin can be no less than 20 g of the matrix. 20g is 25% of 80g, and James consequently teaches that the resin is never included at less than 25% of the filler material weight.

None of the prior art cited compensates for the deficiency in James by teaching or suggesting a polishing article, or a polishing step using such an article, comprising a resin that has at least one epoxy group and is included at a concentration that is between about 5% and about 15% by weight of a friable filler material. It is respectfully noted that the relationship between the amounts of friable filler and the amounts of resin are of importance because it provides a construction that, as originally recited in the independent claims, "cause[s] said polishing surface to continually wear during polishing and thereby facilitate continuous exposure of the abrasive." Consequently, the concentration set forth in the independent claims, as amended, are not obvious modifications of the prior art, but provide a surface wear and polishing feature that is neither explicitly disclosed nor inherently part of the prior art.

In the Advisory Action, the Examiner comments that a calculation of a binder:filler ratio from the James reference is not complete without also factoring for the high modulus phase that James discloses. The Examiner asserts, "It is extremely clear that the matrix of the reference can also include a high modulus phase ... in combination with a resin ... at the defined ratio. In view of this, how can the calculation show any distinction if it does not take into consideration the high modulus phase that can be present as defined by the reference?"

In response to the Examiner's question, the above calculation that the James resin is included at no greater than 25% of the filler material weight is based on only two elements: epoxy resin concentration and filler concentration. This is because the present claim only defines those two elements when reciting the ratio. It is acknowledged that James discloses a high modulus phase in a matrix. However, the high modulus phase does not constitute either an

App. No. 10/712,367
Response filed with RCE

epoxy resin or a filler having a hardness of less than 3 on the Mohs scale. Each of the high modulus materials listed in James (col. 3, lines 50 to 67) has a hardness substantially higher than 3 on the Mohs scale, so the high modulus materials can not possibly be considered filler. Further, none of the listed high modulus materials is an epoxy resin.

To summarize, the pending independent claims recite that the epoxy resin is included at between 5 and 15% by weight of the filler material having a hardness of less than 3 on the Mohs scale, and neither James nor the remaining cited prior art teach or suggest this feature. It is therefore respectfully requested that the rejections under 35 U.S.C. § 103(a) be withdrawn.

B. Conclusion

In view of Applicant's amendments and remarks, it is respectfully submitted that Examiner's objections and rejections have been overcome. Accordingly, Applicants respectfully submit that the application is now in condition for allowance, and such allowance is therefore earnestly requested. Should the Examiner have any questions or wish to further discuss this application, Applicants request that the Examiner contact the Applicants attorneys at the below-listed telephone number.

If for some reason Applicants have not requested a sufficient extension and/or have not paid a sufficient fee for this response and/or for the extension necessary to prevent abandonment on this application, please consider this as a request for an extension for the required time period and/or authorization to charge Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

INGRASSIA FISHER & LORENZ

Dated: September 14, 2005

By: 

David K. Benson
Reg. No. 42,314
(480) 385-5060